U.S. Environmental Protection Agency
Region I, New England
Office of Site Remediation and Restoration
Five-Year Review
South Municipal Water Supply Well Superfund Site, Peterborough, New Hampshire

I. *Introduction*

Authority Statement The U.S. Environmental Protection Agency (EPA), Region I, New England conducted this review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Section 121(c), National Contingency Plan (NCP) Section 300.400(f)(4)(ii), and the Office of Solid Waste and Emergency Response (OSWER) Directives 9355.7-02 (May 23, 1991) and 9355.7-2A (July 26, 1994). It is a statutory review since upon completion of the remedial action hazardous substances will remain above levels that allow for unlimited use and unrestricted exposure at a portion of the Site.

Purpose The purpose of a five-year review is to ensure that a remedial action remains protective of public health and the environment and is functioning as designed. This document will become part of the Site File and as such will be placed in the repositories located at the Peterborough Public Library in Peterborough, New Hampshire and at the EPA Records Center at 90 Canal Street in Boston, Massachusetts. This review, Type I, is applicable to a site at which construction is complete and only long-term response remains.

Site Characteristics The South Municipal Water Supply Well Superfund Site (the Site) is located approximately two miles south of the center of the Town of Peterborough in Hillsborough County, New Hampshire. The South Well, situated at the edge of the Site, is located on Sharon Road, approximately 350 feet east of the Contoocook River. The Site area is approximately 250 acres.

Land use in the vicinity of the Site, particularly east of the river, is rural and undeveloped. A plumbing business and several apartments are situated on the property adjacent to, and south of, the well. Approximately 1,000 feet north of the well and west of the river are an automobile dealership and several commercial establishments. The New Hampshire Ball Bearings, Incorporated (NHBB)manufacturing facility is located approximately 1,200 feet west of the well.

The Site and adjacent area are served by a municipal water system which receives water from two wells located north of the town center. The closest residential wells are located approximately one-half mile north and upgradient of the Site.

The site is situated in the Contoocook River Valley, on glacial/fluvial deposits approximately 20 to 90 feet in thickness. Deposits are dominantly sands and gravels, although silty layers are found dispersed both vertically and horizontally about the site area. The average flow direction is east-northeast in the vicinity of the NHBB plant and changes to a northerly direction at the Contoocook River, paralleling the river. The groundwater velocities are high, as the media is coarse and the gradients large.

The Record of Decision (ROD) issued September 27, 1989, for the South Municipal Water Supply Well Superfund Site (Site) specifies a remedy which addresses contamination of ground water, soils, and wetland sediments. Between July 1990, and January 1993, extensive pre-design investigations were undertaken and the design finalized. As a result of having obtained new, more detailed technical information during these pre-design investigations, an Explanation of Significant Differences (ESD) was issued on May 6, 1993, which documented modifications to the remedy principally for air emission controls and sediment excavation.

The ground water extraction and treatment system has been in operation since March of 1994 and the vacuum extraction system began operation in October of 1994. After reviewing quarterly ground water sampling data over the first two years of remedial actions and considering the changes which occurred since the ROD was issued concerning our understanding of the ability to restore ground water contaminated with dense non-aqueous phase liquids (DNAPLs), EPA determined that it was technically impracticable, from an engineering perspective, to restore that portion of the contaminated ground water affected by Dense Non-Aqueous Phase Liquids (DNAPLs) to drinking water quality in a reasonable time frame. Therefore, a second ESD was issued on February 3, 1997, which documented EPA's decision to waive certain Federal Drinking Water Standards which are applicable or relevant and appropriate requirements (ARARs) for ground water. Because of the determination of technical impracticability, three portions of the remedy were modified by this ESD:

Groundwater Extraction and Treatment

Two aspects of the ground water extraction and treatment component of the remedy were modified.

Air Sparging - The ROD stated that it might be necessary to implement technologies to enhance contaminant removal and to address the presence of free phase solvents in the saturated zone of the NHBB-area plume. Air sparging (in conjunction with the soil vacuum extraction system) was the selected technology. Because of technical problems encountered in implementing the air sparging system, it was never operated.

Ground Water Extraction - The ROD specified that the ground water extraction system for the NHBB area would be designed to create a hydraulic barrier between the NHBB area plume and the rest of the aquifer. Since ARARs are waived, the pumping rates and the extraction well configuration will be changed to maintain the hydraulic barrier

between the NHBB plume area and the rest of the aquifer, but not necessarily to restore the NHBB plume to drinking water quality. Adjustments to the system will be made to allow for the use of the South Well if the Town of Peterborough elects to use it.

In-Situ Vacuum Extraction of Contaminated Soils

Since no soil contact threat was identified, the ROD prescribed a vacuum extraction system (VES) to remediate soils located near the corner of the NHBB facility solely to allow attainment of ground water cleanup levels. Therefore, since as described above, no air sparging was employed and the ground water ARARs were waived, vacuum extraction is no longer being operated.

II. *Discussion of Remedial Objectives; Areas of Non-compliance*

Remedial objectives were developed to mitigate existing and future potential threats to public health and the environment. These response objectives presented in the ROD were:

- Eliminate or minimize, to the maximum extent practicable, the threat posed to the public health, welfare, and environment by the current extent of contamination for groundwater, soils, and sediments;

- To eliminate or minimize the migration of contaminants from the soils into the ground water; and

- To meet federal and state Applicable or Relevant and Appropriate Requirements (ARARs).

The second ESD essentially eliminated the need to meet the objective dealing with soil contamination. Soil vacuum extraction had been operated solely to eliminate or minimize the migration of contaminants from the soils into the ground water, since no soil contact threat was identified. However, because the issuance of the ESD resulted in the waiver of ground water ARARs near the NHBB facility, vacuum extraction was no longer required and has since been discontinued. Ground water monitoring data indicates that the cleanup of the ground water outside the "Waiver area" is progressing as anticipated while the ground water within the "Waiver area" is being contained through pumping and treatment. The cleanup goals for ground water, developed in response to the first objective along with the maximum levels of contaminants found in monitoring wells outside the "Waiver area" are presented below.

Contaminant	Target Level (ppb)	Max Level (ppb)
Tetrachloroethylene	5	5
1,1,1-Trichloroethane	200	17
Trichloroethylene	5	6
1,1-Dichloroethylene	7	1
Toluene	2000	not detected
1,1-Dichloroethane	810	0.8
Vinyl Chloride	2	not detected

The contaminated sediments have been removed from the wetlands; the wetlands have been regraded and replanted, and the restoration efforts have been successful.

The Town of Peterborough, using information supplied by NHBB, has enacted zoning restrictions prohibiting use of contaminated ground water. These restrictions have been effective as evidenced by EPA being notified of and involved in the review of a proposed extraction well for a bottled-water plant near the restricted area. In order to further ensure the protectiveness of the remedy, a deed restriction will be placed upon the NHBB property prohibiting extraction of the ground water for purposes other than the remedial action unless the extracted ground water meets or is treated to appropriate water use and/or disposal standards in effect at the time of extraction and the extraction of the ground water does not adversely affect the remedial action. Discussions between EPA and NHBB are taking place to secure the deed restriction.

III. *ARARs Review*

As mentioned in the previous section, a Technical Impracticability Waiver was granted which eliminated the requirement to meet ground water cleanup levels in a portion of the aquifer on NHBB property, but which required containment of that ground water so as not to impact other portions of the aquifer. With the exception of the "Waiver area," all ARARs will be achieved.

The bases for two of the ground water cleanup levels have changed. The ROD set the cleanup level for toluene at 2000 ppb, the Maximum Contaminant Level (MCL) at the time. Subsequently, the MCL has been promulgated at 1000 ppb. Because toluene is not now being detected at the Site, the remedy remains protective and is in compliance with ARARs.

The other compound for which the basis of the cleanup level has changed is 1,1-Dichloroethane. The cleanup level, 810 ppb, was as a result of a New Hampshire consumption advisory for water supplies. This level has been lowered to 81 ppb. Since less than one part per billion is being detected at the Site, the remedy remains protective and is in compliance with ARARs.

IV. *Summary of Site Visit*

The EPA Remedial Project Manager, Roger Duwart, conducted a Site inspection on May 4, 1998. The inspection verified that the ground water treatment plant was operational and that no activities have occurred which would call into question the protectiveness of the remedy.

In addition, over the last few months, the Remedial Project Manager has had several discussions with NHBB officials, the Peterborough Town Manager and the Peterborough Director of Public Works concerning the possible future use of the South Well aquifer. These discussions are on-going and will help to ensure that possible use of the ground water can be done without being impacted by the Site contamination and that use of the aquifer will not adversely affect the cleanup.

V. *Recommendations*

The periodic ground water monitoring should continue in order to ensure the containment of the "Waiver area" ground water and to monitor the progress of the cleanup of the ground water outside of the "Waiver area."

The potential for ground water development should continue to be monitored to ensure that institutional controls remain effective and that adjustments to the ground water extraction system are made, if necessary.

VI. *Statement of Protectiveness*

I certify that the remedy selected for this Site remains protective of human health and the environment.

VII. *Next Five-Year Review*

In accordance with OSWER Directive 9355.7-2A (July 26, 1994), the next five-year review will be conducted five years from the date of the signing of this review.

Frank Cavallaro for

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Office of Site Remediation and Restoration
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6/2/98
Date